CLAIMS

What is claimed is:

1. A multiband transmitter circuit operative to receive a transmitter input signal and to produce a transmitter output signal at a frequency defined in at least one of a first band of frequencies, or a second band of frequencies, the multiband transmitter circuit comprising:

at least a first oscillator circuit operative to produce a first output frequency signal defined within the first band of frequencies in response to the transmitter input signal;

at least a first signal processing circuit operatively coupled to the first oscillator circuit, and operative to produce the transmitter output signal defined within the first band of frequencies in response to the first output frequency signal;

at least a second oscillator circuit operative to produce a second output frequency signal defined within the second band of frequencies in response to the transmitter input signal; and

at least a second signal processing circuit operatively coupled to the second oscillator circuit, and operative to produce the transmitter output signal defined within the second band of frequencies in response to the second output frequency signal.

2. The multiband transmitter circuit of claim 1, wherein the first oscillator circuit further comprises a first voltage controlled oscillator (VCO)

operative to produce a first VCO output frequency signal defined within the first band of frequencies in response to the transmitter input signal, and the second oscillator circuit further comprises a second VCO operative to produce a second VCO output frequency signal defined within the second band of frequencies in response to the transmitter input signal.

3. The multiband transmitter circuit of claim 2, comprising a power reduction circuit operatively coupled to the first VCO, the first signal processing circuit, the second VCO, and the second signal processing circuit, wherein:

in response to a power control signal that represents transmitting in the first band of frequencies, the power reduction circuit selectively reduces power to the second VCO and to the second signal processing circuit, and

in response to a power control signal that represents transmitting in the second band of frequencies, the power reduction circuit selectively reduces power to the first VCO, and to the first signal processing circuit.

4. The multiband transmitter circuit of claim 2, comprising:

band selection circuit operative to provide a power control signal that represents transmitting in the first band of frequencies or in the second band of frequencies, wherein the band selection circuit is operatively coupled to a power reduction circuit wherein:

in response to the power control signal that represents transmitting in the first band of frequencies, the band selection circuit provides a

first power control signal to the power reduction circuit to selectively reduce power to the second VCO, and to the second signal processing circuit, and

in response to the power control signal that represents transmitting in the second band of frequencies, the band selection circuit provides a second power control signal to the power reduction circuit to selectively reduce power to the first VCO and to the first signal processing circuit.

5. The multiband transmitter circuit of claim 2, comprising a synthesizer operative to receive the first and second VCO output frequency signals, wherein the synthesizer is operative to provide the transmitter input signal to the first and second VCOs.

6. The multiband transmitter circuit of claim 1, comprising

at least one band selection switch operative to select the transmitter output signal defined within the first band of frequencies, and the transmitter output signal defined within the second band of frequencies to produce a output signal; and

at least one antenna operative to transmit the output signal in response to the output signal.

7. The multiband transmitter circuit of claim 1, wherein the first band of frequencies is substantially from 824 MHz to 915 MHz, and the second band of frequencies is substantially from 1710 MHz to 1910 MHz.

8. The multiband transmitter circuit of claim 2, wherein the first VCO output frequency signal is an integral multiple of the transmitter output signal at a

frequency defined in the first band of frequencies, and the second VCO output frequency signal is an integral multiple of the transmitter output signal at a frequency defined in the second band of frequencies.

9. The multiband transmitter circuit of claim 2, wherein the multiband circuit is also a multimode transmitter circuit, and wherein at least the first signal processing circuit further comprises:

a first divide by N circuit, wherein N is an integer, operative to produce a first divided output signal in response to the first VCO output frequency signal defined within the first band of frequencies;

a first linear modulation circuit operative to provide a first linear modulation output in response to the first divided output signal;

a first nonlinear modulation circuit operative to provide a first nonlinear modulation output in response to the first divided output signal;

wherein the second signal processing circuit further comprises:

a second divide by N circuit, wherein N is an integer, operative to produce a second divided output signal in response to the second VCO output frequency signal;

a second linear modulation circuit operative to provide a second linear modulation output in response to the second divided output signal; and

a second nonlinear modulation circuit operative to provide a second nonlinear modulation output in response to the second divided output signal.

10. The multiband transmitter circuit of claim 9, comprising a power reduction circuit operatively coupled to the first and second VCOs, the first and second divide by N circuits, the first and second linear modulation circuits, and the first and second nonlinear modulation circuits, wherein:

in response to detecting a transmitter mode to produce a transmitter output signal with linear modulation, the power reduction circuit is operative to selectively reduce power to the second VCO, the second divide by N circuit, the second linear modulation circuit, the second nonlinear modulation circuit, and the first nonlinear modulation circuit; and

in response to detecting a transmitter mode to produce a transmitter output signal with nonlinear modulation, the power reduction circuit is operative to selectively reduce power to the first VCO, the first divide by N circuit, the first linear modulation circuit, the first nonlinear modulation circuit, and the second linear modulation circuit.

11. The multiband transmitter circuit of claim 9, comprising a power reduction circuit operatively coupled to the first and second VCOs, the first and second divide by N circuits, the first and second linear modulation circuits, and the first and second nonlinear modulation circuits, wherein:

in response to detecting a transmitter modulation mode operative to produce a transmitter output signal with either linear or nonlinear modulation, and a first band selection to produce the transmitter output signal defined in the first band of frequencies, the power reduction circuit is operative to selectively reduce power to the second VCO, the second divide by N circuit, the second linear modulation circuit, the second nonlinear modulation circuit, and at least one of: the first non-linear modulation circuit if the transmitter mode operative to produce a transmitter output signal with linear modulation is detected, and the first linear modulation circuit if the transmitter mode operative to produce a transmitter output signal with nonlinear modulation is detected; and

in response to detecting a transmitter modulation mode operative to produce a transmitter output signal with either linear or nonlinear modulation, and a second band selection to produce a transmitter output signal defined in the second band of frequencies, the power reduction circuit is operative to selectively reduce power to the first VCO, the first divide by N circuit, the first linear modulation circuit, the first nonlinear modulation circuit, and at least one of: the second nonlinear modulation circuit if the transmitter mode operative to produce a transmitter output signal with linear modulation is detected, and the second linear modulation circuit if the transmitter mode to produce a transmitter output signal with nonlinear modulation is detected.

12. The multiband transmitter circuit of claim 9, comprising:

band selection circuit operative to provide a power control signal in response to detecting a transmitter band selection to produce the transmitter output signal at a frequency defined in the first band of frequencies or in the second band of frequencies, wherein the band selection circuit is operatively coupled to a power reduction circuit wherein:

in response to the power control signal associated with a transmitter band selection to produce the first band of frequencies, the band selection circuit is operative to provide a first power control signal to the power reduction circuit to selectively reduce power to the second VCO, second divide by N circuit, the second linear modulation circuit, the second nonlinear modulation circuit, and at least one of: the first linear modulation circuit, and the first nonlinear modulation circuit; and

in response to the power control signal associated with a transmitter band selection to produce the second band of frequencies, the band selection circuit is operative to provide a second power control signal to the power reduction circuit to selectively reduce power to the first VCO, the first divide by N circuit, the first linear modulation circuit, the first nonlinear modulation circuit, and at least one of: the second linear modulation circuit, and the second nonlinear modulation circuit.

13. The multiband transmitter circuit of claim 9 wherein the first VCO output frequency signal is associated with an N times a first transmitter output

signal frequency defined in the first band of frequencies, and the second VCO output frequency signal is associated with an N times a second transmitter output signal frequency defined in the second band of frequencies.

14. The multiband transmitter circuit of claim 9, wherein the first linear modulation circuit is operative to modulate the first divided output signal in response to a base band in phase and quadrature phase signal, and the second linear modulation circuit is operative to modulate second divided output signal in response to the base band in phase and quadrature phase signal.

15. A wireless device comprising:

a multiband transmitter circuit operative to receive a transmitter input signal and to produce a transmitter output signal at a frequency defined in at least one of a first band of frequencies, or a second band of frequencies comprising:

at least a first oscillator operative to produce a first output frequency signal defined within the first band of frequencies;

at least a first signal processing circuit operatively coupled to the first oscillator and operative to produce the transmitter output signal defined within the first band of frequencies in response to the first output frequency signal;

at least a second oscillator operative to produce a second output frequency signal defined within the second band of frequencies;

at least a second signal processing circuit operatively coupled to the second oscillator and operative to produce the transmitter output

signal defined within the second band of frequencies in response to the second output frequency signal;

an antenna operatively coupled to the multiband transmitter circuit and operative to transmit the transmitter output signal; and

processing circuit operative to control the multiband transmitter circuit and operative to produce the transmitter output signal defined in at least one of each of the first and second band of frequencies.

16. The wireless device of claim 15, wherein the first oscillator circuit further comprises a first voltage controlled oscillator (VCO), and the second oscillator circuit further comprises a second VCO, the wireless device further comprising:

a power reduction circuit operatively coupled to the first VCO, the first signal processing circuit, the second VCO, and the second signal processing circuit, wherein:

in response to a power control signal that represents transmitting in the first band of frequencies, the power reduction circuit selectively reduces power to the second VCO and to the second signal processing circuit, and

in response to a power control signal that represents transmitting in the second band of frequencies, the power reduction circuit selectively reduces power to the first VCO, and to the first signal processing circuit.

17. The wireless device of claim 15, wherein the first oscillator circuit further comprises a first voltage controlled oscillator (VCO), and the second

oscillator circuit further comprises a second VCO, the wireless device further comprising:

band selection circuit operative to provide a power control signal that represents transmitting in the first band of frequencies or in a second band of frequencies, wherein the mode detection circuit is operatively coupled to a power reduction circuit wherein:

in response to the power control signal that represents transmitting in the first band of frequencies, the band selection circuit provides a first power control signal to the power reduction circuit to selectively reduce power to the second VCO and to the second signal processing circuit, and

in response to the power control signal that represents transmitting in the second band of frequencies, the band selection circuit provides a second power control signal to the power reduction circuit to selectively reduce power to the first VCO and to the first signal processing circuit.

18. The wireless device of claim 15, comprising a synthesizer operative to receive the first oscillator and second oscillator output frequency signals, wherein the synthesizer is operatively coupled to the first oscillator and second oscillator to provide a transmitter input signal.

19. A method for producing a transmitter output signal at a frequency defined in at least one of a first band of frequencies, or a second band of frequencies, the method comprising:

producing a first oscillator output frequency signal defined within the first band of frequencies in response to receiving a transmitter input signal;

producing the transmitter output signal defined within the first band of frequencies in response to the first oscillator output frequency signal;

producing a second oscillator output frequency signal defined within the second band of frequencies in response to receiving the transmitter input signal; and

producing the transmitter output signal defined within the second band of frequencies in response to the second oscillator output frequency signal.

20. The method for producing a transmitter output signal of claim 19 wherein a first oscillator produces the transmitter output signal defined within the first band of frequencies, and a second oscillator produces the second oscillator output frequency signal defined within the second band of frequencies, the method comprising:

reducing power to the first oscillator that produces the first oscillator output frequency signal, in response to a power control signal that represents transmitting in the second band of frequencies, and

reducing power to the second oscillator that produces the second oscillator output frequency signal in response to a power control signal that represents transmitting in the first band of frequencies.